CHANGE IN THE CHEMICAL COMPOSITION OF CARROT ROOTS DEPENDING ON STORAGE AND CULTIVATION TECHNOLOGY

[1]Nazirova Rahnamokhon Mukhtarovna, [2]Makhmudov Nozimjon Nuriddin ugli, [3]Usmonov Nodirjon Botiraliyevich

Doctor of Technical Sciences (PhD), Associate Professor of the Department "Technology of storage and primary processing of agricultural products" of the Fergana Polytechnic Institute[1], Master student of group M19-20 Fergana Polytechnic Institute[2], Lecturer of the Department "Technology of storage and primary processing of agricultural products "Fergana Polytechnic Institute[3]

ANNOTATION

Carrots are the most valuable root vegetable, which is important in human nutrition. It is rich in vitamins, minerals and crude fiber. But the amount of nutrients directly depends on the cultivation conditions and storage regimes. It has been established that the use of nitrogen fertilizers leads to an increase in the amount of dry matter, but at the same time, the amount of losses during storage increases.

Key words: carrots, storage modes, root crops, minerals, carotene, dry substances, nitrates.

Carrots are a highly nutritious root vegetable. It has been used as a medicinal plant for about 4 thousand years. It is widely used in gastronomy as the most popular seasoning, and it can also be a staple in a dish.

Carrots are a very healthy vegetable for the body. The beneficial and medicinal properties of carrots are explained by its rich composition. Carrots contain vitamins of group B, PP, C, E, K, it contains carotene - a substance that in the human body turns into vitamin A. There are many minerals in carrots necessary for the human body: potassium, iron, phosphorus, magnesium, cobalt , copper, iodine, zinc, chromium, nickel, fluorine, etc. Carrots contain essential oils, which cause its peculiar smell.

Carrots are a multivitamin vegetable. The nutritional value of root crops is determined by the high content of carbohydrates, fats, proteins, the presence of organic acids, mineral salts and special taste. This culture is called the storehouse of vitamins. The roots of carrots contain water-soluble vitamins B1, B2, B6 and fat-soluble vitamins E, D, K, essential oils, flavonoids. Water in carrots contains 88.8%, nitrogenous substances - 1.1%, fats - 0.2%, carbohydrates - 9.2%. Carrots also contain a small amount of iodine.

The special value of carrots is explained by the high content of provitaminA - carotene. In humans and animals, carotene is converted into retinol - vitamin A. The minimum daily intake of vitamin A for humans is 3300 IU, which corresponds to 1 mg of pure vitamin or 2 g of carotene. The World Health Organization recommends the consumption of 120-140 kg of vegetables per year, incl. 20 kg of carrots.

Carrots, as a source of carotene, are prescribed after myocardial infarction. Carotene in carrots is necessary for the normal growth of children, good vision, it improves the condition of the skin and mucous membranes.

Carrots are high in sodium and phosphorus compared to other vegetable crops (Table 1).

Table 1

Mineral salt content (mg / 100 g vegetables)

Vegetables	Potassium	Sodium	Кальций	Магний	Iron	Phosphorus	Sulfur
Tomato	378,0	169,0	60,0	85,0	23,0	93,0	47,0
Carrot	272,0	156,0	83,0	32,0	7,4	94,0	47,0

When growing a crop such as carrots, a vegetable grower requires not only the ability to grow a high yield, but also the ability to preserve root crops for a long time. Under current conditions, root crops directly

from the field consume only 1 ... 1.5 months, and the rest of the year they use carrots from storage. Therefore, it is very important to choose the correct storage method according to the storage capacity and conditions.

Optimal storage conditions for carrot root crops: temperature 0 ° C and air humidity 95 ... 98%.

Growing conditions affect not only the yield of carrots, but also the keeping quality of root crops during storage. This is manifested by changing the speed of all processes occurring in the tissues of root crops.

The conditions of cultivation of root crops have a great influence on the safety. The introduction of increased doses of nitrogen fertilizers and abundant irrigation lead to an increase in the yield of root crops, but reduce their quality, transportability and preservation. The type of soil also affects the health of carrots.

Preservation depends on the timing of sowing and harvesting, that is, on the duration of the growing season. Root crops harvested at the age of 100 ... 110 days (the period from mass germination to harvesting) are better preserved. Preservation at a late sowing period practically does not decrease.

The loss of water and dry matter in carrot roots depends on soil fertility. Root crops grown on poorly cultivated soil had a lower water-holding capacity compared to root-fruits grown on well-cultivated soil (Soloviev, 1982). The consumption of plastic substances increases with the wilting of root crops, due to an increase in the hydrolytic activity of enzymes. Losses of dry matter of root crops during storage, cultivated on various soils were:

- on cultivated soils - 15 ... 20%;
- on uncultivated soils - 20 ... 25%.

The loss of carbohydrates is mainly associated with their use in the breathing process. The amount of disaccharides in root crops,% of the original content, by the end of storage was:

- on cultivated soils - 65 ... 80;
- on uncultivated soils - 63 ... 74;

With a full-fledged mineral nutrition of root crops, during storage, the sugar content increased and the amount of polysaccharides increased (Table 2). For proteins of root crops this pattern is also observed.

Table 2.

Influence of the mineral nutrition of carrot roots on the amount of carbohydrates in root crops after storage, (% of the original content)

Experiencenumber	NO_3	P_2O_5	K_20
Thecontrol	75	73	76
(withoutfertilizers)	-	-	-
$N_{100}P_{80}$	86	80	63
N_{100} $P_{80}K_{100}$	82	75	85

The use of nitrogen fertilizers (against the background of P80 K100) in increased doses leads to an increase in the loss of dry matter and water in carrot root crops during storage. The greatest increase in losses is observed when the maximum doses of nitrogen are applied (110 ... 185 kg / ha).

The amount of carotene and vitamins in root crops decreases during storage. By the end of the storage period, they contain,% of the original amount:

- ascorbic acid 80 ... 91;

- carotene 26 ... 59;

Сорта	NO_3	NO_2	Срок хранения	NO_3	NO_2
Karotan	175,8	158,1	87	109,1	59
VitaLonga	181,5	164,5	87	102,6	63
Samson	147,1	138,7	80	95,4	64

- thiamine 45 ... 67;

- riboflavin 1 ... 13.

When storing carrots in containers (in boxes), there was a decrease in the level of nitrates in the root crops of the following varieties (Table 3).

Tab. 3

Changes in nitrate content in root crops of various carrot varieties during storage

Most of the nitrates when laying for storage were contained in the root crops of the Vita Longa variety. The greatest decrease in the amount of nitrates after 2 months of storage occurred in the root crops of Samson carrots. After 6 months of storage, the greatest losses of nitrates were noted in the root crops of the Karotan variety (42%), the smallest - in the root crops of the Samson variety (38%).

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